

I claim:

1        1.        A device for transplanting donor corneal tissue onto a mammalian recipient's eye,  
2                   comprising:

3                   (a)        a cutting blade; wherein the dimensions and shape of said cutting blade are adapted  
4                   to allow said cutting blade to cut a cornea button suitable for transplantation from the donor corneal  
5                   tissue;

6                   (b)        a removable, concave base plate comprising a proximal end having a plurality of  
7                   suction ports, and a distal end having a plurality of suture grooves; wherein said suction ports are  
8                   adapted to receive and distribute a negative pressure to hold the donor corneal tissue; and wherein  
9                   said suture grooves have a size and shape adapted to guide a suture needle into the cornea button and  
10                  through surrounding corneal tissue when the cornea button is placed on the recipient's eye;

11                  (c)        a concave support block having a bore adapted to receive said base plate; wherein said  
12                  block is adapted, so that when said base plate is positioned in said bore, said support block and said  
13                  base plate form a smooth and continuous concave surface that approximates the curvature of the  
14                  anterior surface of the corneal tissue; and

15                  (d)        a vacuum device adapted to supply a negative pressure to the cornea button to hold  
16                  the cornea button on said base plate;

17 wherein:

18 (e) when negative pressure is applied to the donor corneal tissue, a cornea button may  
19 be cut from the donor corneal tissue, placed onto to the recipient's eye, and sutured to the remaining  
20 corneal tissue of the recipient.

1 2. A device as recited in Claim 1, additionally comprising a handle attached to said base plate.

1 3. A device as recited in Claim 2, wherein said handle is a syringe-type suction device.

1 4. A device as recited in Claim 1, wherein the size of said cutting blade is adapted to cut the  
2 donor corneal tissue to a size that is slightly larger than said base plate.

1 5. A device as recited in Claim 1, wherein the size of said cutting blade is adapted to cut the  
2 donor corneal tissue to a size that is slightly smaller than said base plate.

1 6. A device as recited in Claim 1, additionally comprising a lid to hold said cutting blade,  
2 wherein said lid further comprises a plurality of inserts positioned at each corner; and wherein said  
3 support block further comprises ports located at the periphery of said support block; wherein said  
4 ports are adapted to receive said inserts to align the position of said lid in said support block.

1     7.     A device as recited in Claim 1, wherein said suture grooves are adapted to allow a suture  
2     needle to pass through the distal end of said removable, concave base plate as the suture needle is  
3     passed through the cornea button and surrounding recipient corneal tissue.

1     8.     A method for surgically promoting grafting between a healthy donor cornea button and a  
2     mammalian recipient's remaining corneal tissue using a device as recited in Claim 1; said method  
3     comprising holding the donor corneal tissue to the removable, concave base plate with negative  
4     pressure from the vacuum device; cutting a cornea button from the donor corneal tissue; placing the  
5     cornea button onto the recipient's eye, while maintaining negative pressure; and suturing the cornea  
6     button to the recipient's corneal tissue by suturing through the suture grooves.

1     9.     A method as recited in Claim 8, wherein the diameter of the cornea button is slightly larger  
2     than the portion of the cornea removed from the recipient.

1     10.    A method as recited in Claim 8, additionally comprising the steps of detaching the base plate  
2     from the support block, and positioning the base plate near the recipient's eye, while maintaining  
3     negative pressure on the cornea button, so that the cornea button fills the void created where a  
4     portion of the cornea was removed from the recipient's eye.

1     11.    A method as recited in Claim 8, additionally comprising the steps of inserting a suture needle  
2     into a suture groove, and passing the suture needle and suture into the cornea button and through the  
3     surrounding corneal tissue.

**Express Mail No. EK968023596**

1      12.      A method as recited in Claim 11, wherein the suture is a running suture.

1      13.      A method as recited in Claim 11, additionally comprising the steps of passing the suture  
2      through the suture groove slit, and repeating the steps of Claim 11 until sutures have been passed  
3      through all of the suture grooves.